

Biresin® CR83

Composite resin system

Product Description

Biresin® CR83 is an epoxy resin system with extremely low viscosity designed specifically for the infusion process for the production of high performance fibre reinforced composites parts and moulds. The system has thermal properties up to 80°C. Biresin® CR83 epoxy resin has a low tendency to crystallise.

Application Areas

Biresin® CR83 is especially suited to the infusion and injection processes due to its low viscosity range. It can be used in the marine and general industrial composite areas. Due to its good wetting properties it is particularly suited for use with carbon fibre reinforcement.

Features / Advantages

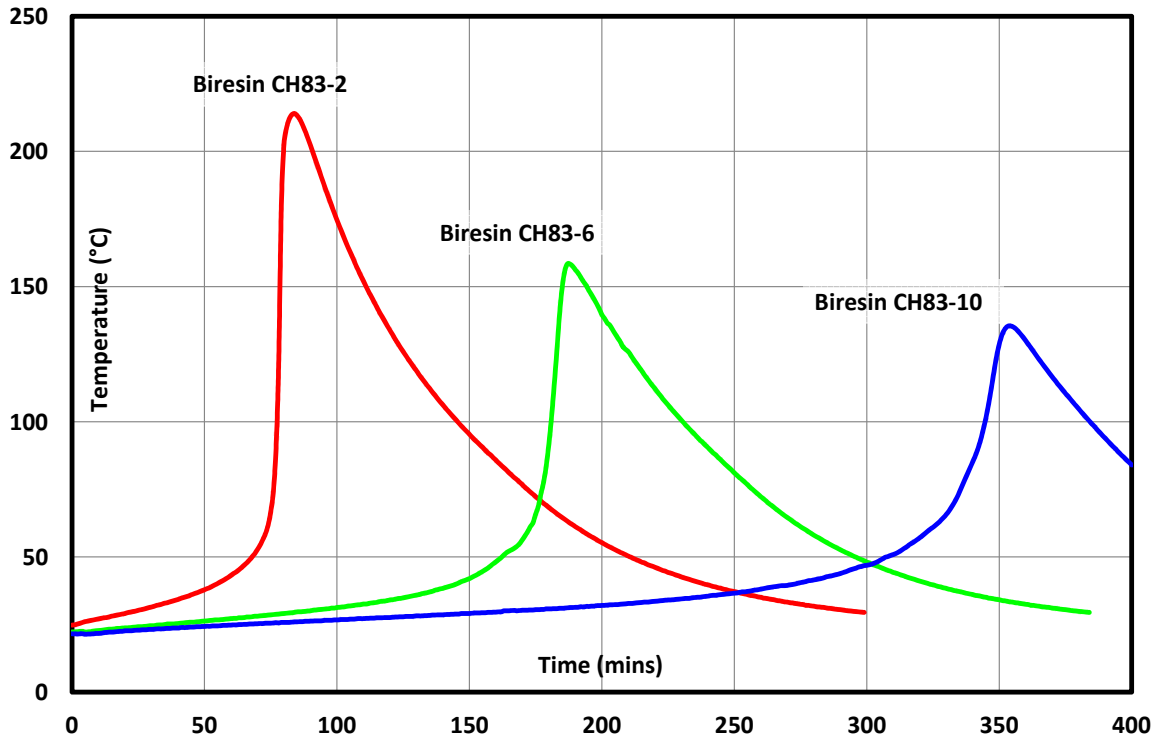
- 3 hardeners (B) give a wide range of processing times
- The reactivity can be adapted by mixing the hardeners
- Fast infusion and good wet-out of fabrics and non-wovens due to low viscosity and good wetting characteristics even at low temperatures
- All systems DNV GL approved, Certificate No. TAK000019Z
- Glass transition temperatures up to 80°C dependent on curing conditions
- Biresin® CR83 resin (A) has a low tendency to crystallise

Physical Data		Resin (A)		Hardener (B)	
Individual Components		Biresin® CR83	Biresin® CH83-2	Biresin® CH83-6	Biresin® CH83-10
Mixing ratio, parts by	weight	100	30		
Mixing ratio, parts by	volume	100	36		
Colour		translucent	colourless to yellowish		
Viscosity, 25°C	mPa.s	~610	<10	<10	< 10
Density, 25°C	g/ml	1.14	0.95	0.94	0.95
		Mixture			
Potlife, 100 g / RT, approx. values		min	60	180	300
Mixed viscosity, 25°C, approx. values		mPa.s	155	170	155

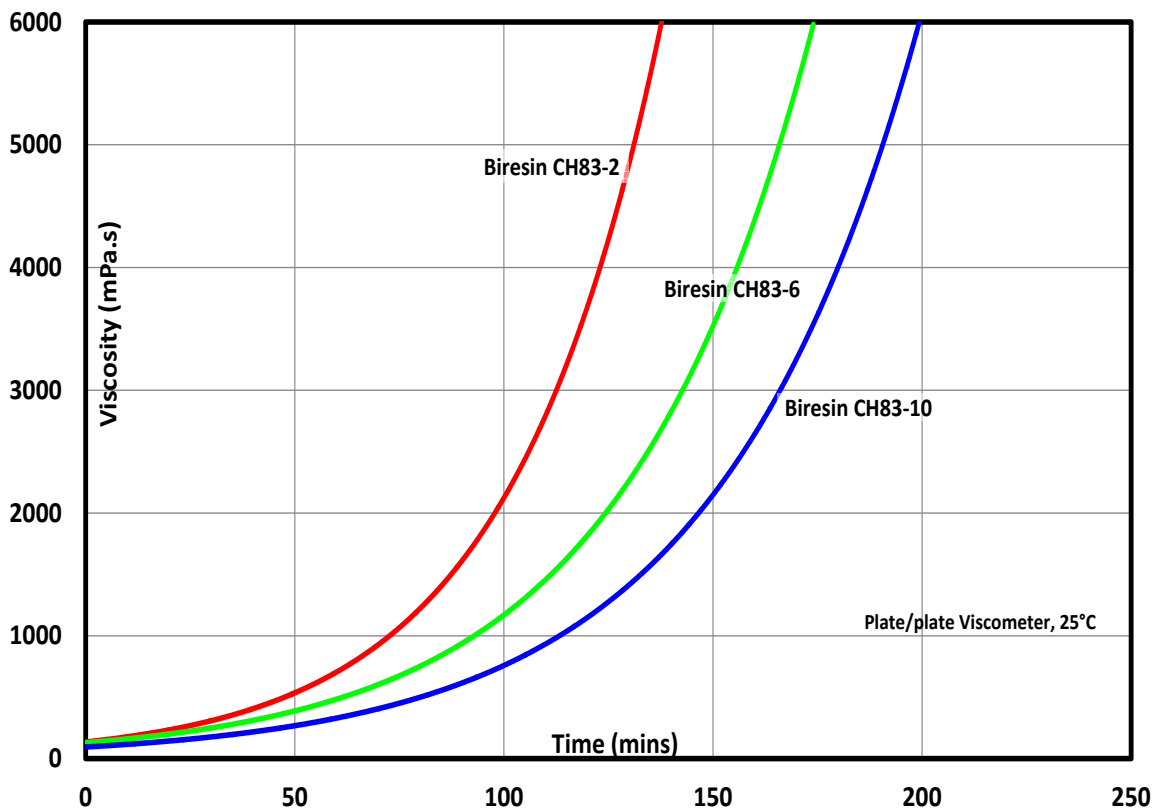
Processing

- The material and processing temperatures should be in the range 18 - 35°C.
- The mixing ratio must be followed accurately to obtain best results. Deviating from the correct mix ratio will lead to lower performance.
- The final mechanical and thermal values are dependent on the applied postcuring cycles.
- It is recommended to clean brushes or tools immediately after use with Sika Reinigungsmittel 5.
- Additional information is available in "Processing Instructions for Composite Resins".

Development of Exotherm of Biresin® CR83-Resin (A)-Hardener (B)-Mixtures, 100g / RT, insulated



Development of Viscosity of Biresin® CR83 (A)-Resin-Hardener (B)-Mixtures, 25°C



Postcuring

The suitable cure cycle and the attainable mechanical and thermal values depend on various factors, such as laminate thickness, fibre volume, reactivity of the resin system etc.

An appropriate cure cycle could look as follows:

- Heat-up rate of ca. 0.2°C/Minute until approx. 10°C below the required glass transition temperature (T_g)
- Followed by a dwell at that temperature of between 2 and 12 hours.
- Part(s) should then be cooled at ~0.5°C per minute

The specific postcure should be adapted to the required technical and economic requirements.

To measure the mechanical performance of the resin system a Sika Advanced Resins standard cycle is used to ensure that the full T_g potential of the system in question is reached.

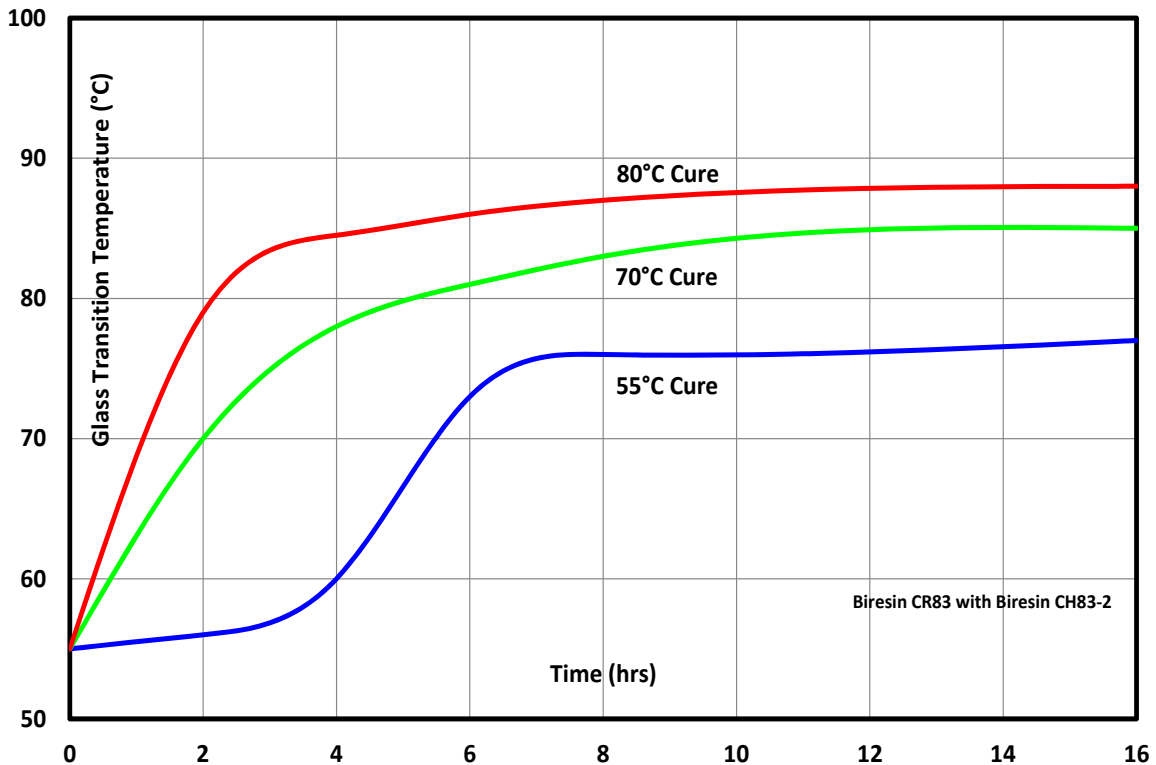
Typical Mechanical Properties of Fully Cured Neat Resin

Biresin® CR83 resin (A)	with hardener (B) Biresin®		CH83-2	CH83-6	CH83-10
Tensile strength	ISO 527	MPa	84	91	86
Tensile E-Modulus	ISO 527	MPa	2,960	3,200	3,100
Elongation at break	ISO 527	%	6.7	8.4	7.9
Flexural strength	ISO 178	MPa	129	134	131
Flexural E-Modulus	ISO 178	MPa	3,125	3,360	3,340
Compressive strength	ISO 604	N/mm ²	107	111	109
Density	ISO 1183	g/cm ³	1.15	1.15	1.15
Shore-hardness	ISO 868		D 85	D 85	D 85
Impact resistance	ISO 179	kJ/m ²	93	84	83

Typical Thermal Properties of Fully Cured Neat Resin

Biresin® CR83 resin (A)	with hardener (B) Biresin®		CH83-2	CH83-6	CH83-10
Heat distortion temperature	ISO 75B	°C	79	79	78
Glass transition temperature	ISO 11357	°C	84	80	81

Glass Transition Temperature vs. Cure Cycle



Packaging (net weight, kg)

Biresin® CR83 resin (A)	1,000	200		10
Biresin® CH83-2 hardener (B)		180	20	3.0
Biresin® CH83-6 hardener (B)		180	20	3.0
Biresin® CH83-10 hardener (B)		180	20	3.0

Storage

- Minimum shelf life of Biresin® CR83 resin (A) is 24 month and of Biresin® CH83-2, CH83-6 and CH83-10 hardeners (B) is 12 month under room conditions (18 - 25°C), when stored in original unopened containers.
- The tendency to of crystallise with this system is very low. However, if crystallisation of the resin (A) component appears, it can be easily removed by warming up the resin for a sufficient time to at least 60°C.
- Containers must be closed tightly immediately after use. The residual material needs to be used up as soon as possible.

Health and Safety Information

For information and advice on the safe handling, storage and disposal of chemical products, users shall refer to the most recent Safety Data Sheet (SDS) containing physical, ecological, toxicological and other safety related data.

Disposal considerations

Product Recommendations: Must be disposed of in a special waste disposal unit in accordance with the corresponding regulations.

Packaging Recommendations: Completely emptied packagings can be given for recycling. Packaging that cannot be cleaned should be disposed of as product waste.

Value Bases

All technical data stated in this Product Data Sheet are based on laboratory tests. Actual measured data may vary due to circumstances beyond our control.

Legal Notice

The information, and, in particular, the recommendations relating to the application and end-use of Sika products, are given in good faith based on Sika's current knowledge and experience of the products when properly stored, handled and applied under normal conditions in accordance with Sika's recommendations. In practice, the differences in materials, substrates and actual site conditions are such that no warranty in respect of merchantability or of fitness for a particular purpose, nor any liability arising out of any legal relationship whatsoever, can be inferred either from this information, or from any written recommendations, or from any other advice offered. The user of the product must test the product's suitability for the intended application and purpose. Sika reserves the right to change the properties of its products. The proprietary rights of third parties must be observed. All orders are accepted subject to our current terms of sale and delivery. Users must always refer to the most recent issue of the local Product Data Sheet for the product concerned, copies of which will be supplied on request.

Further information available at:

Sika Deutschland GmbH

Subsidiary Bad Urach

Stuttgarter Str. 139

D - 72574 Bad Urach

Germany

Tel: +49 (0) 7125 940 492

Fax: +49 (0) 7125 940 401

Email: tooling@de.sika.com

Internet: www.sikaadvancedresins.com



TYPE APPROVAL CERTIFICATE

This is to certify:

That the Epoxy Systems

with type designation(s)
Biresin CR83 - Series

Issued to

Sika Deutschland GmbH
Stuttgart, Germany

is found to comply with
DNV GL class programme DNVGL-CP-0089 – Type approval – Epoxy resin systems

Application :

Laminating resin for construction of laminates made of fibre reinforced plastics.

Issued at **Hamburg** on **2018-07-06**

This Certificate is valid until **2023-07-05**.

DNV GL local station: **Hamburg Materials & Welding**

for **DNV GL**

Approval Engineer: **Guido Michalek**

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Thorsten Lohmann
Head of Section

This Certificate is subject to terms and conditions overleaf. Any significant change in design or construction may render this Certificate invalid. The validity date relates to the Type Approval Certificate and not to the approval of equipment/systems installed.



Product description

Two component epoxy resin system.

Approved variants

Epoxy resin Biresin CR83 with following hardener

- Biresin CH83-2
- Biresin CH83-6
- Biresin CH83-10

Type Approval documentation

- Technical Data Sheet
- Material Safety Data Sheet
- Test Report issued by IFB Stuttgart dated 2009-12-10.
- Approval of Manufacturer Certificate AMPM000001T, valid until 2020-11-16.
- Quality assurance/control documentation

Material Properties

Properties	Viscosity 25°C, D=50 1/s	Viscosity 25°C, D=300 1/s	Density 20°C	Tg DSC	Amine Value
Test Method	U-QP015	U-QP015	U-QP010	U-QP296*	U-QP040F
Unit	mPa·s	mPa·s	g/ml	°C	Mg(KOH)/g
Biresin CR83	500 - 650	N/A	1.14 - 1.16	115.0 - 135.0	N/A
Biresin CH83-2	N/A	< 20	N/A	110.0 - 130.0	660 - 690
Biresin CH83-6	N/A	< 20	N/A	110.0 - 130.0	555 - 595
Biresin CH83-10	N/A	< 20	N/A	110.0 - 130.0	540 - 580

*) The Tg has been determined with SIKA standard resin or hardener for quality control. The values do not provide results comparable to the technical data sheets.

Limitation

The resin complies with the applicable requirements of DNV GL and is compatible to the fibres, adhesives and core materials. Any significant changes in design and / or quality of the material will render the approval invalid.

Assessed production site

SIKA Deutschland GmbH
Stuttgarter Strasse 117
72574 Bad Urach
Germany

Periodical assessment

A production site with a valid Approval of Manufacturer (AoM) certificate for material in question is exempted from the obligation concerning retention and renewal assessments.



Job Id: **262.1-029349-1**
Certificate No: **TAK000019Z**

For manufacturer without a valid AoM a periodical assessment after 2.5 years and at renewal after 5 years is required.

Remarks

This certificate supersedes the type approval WP 1420017 HH.

END OF CERTIFICATE